AMPEX

July 18, 1975
Serial No. TMS-2/045

Copy to ADDA-7/21 (E)

STATINTL

[redacted] COTR
Room GA0519
C.I.A.
Headquarters Building
Washington, D.C. 20505

Subject : Contract XG 3766, TMS-2 Mass Storage System;
Submittal of Monthly Technical Letter Progress Report

Reference: Agency Letter of July 7, 1975;
STATINTL [redacted] to William J. Cassell

Gentlemen:

In accordance with the requirement of Article 4e of Amendment No.5 of the subject contract, forwarded herewith are five(5) copies of our Progress Report for the month of June 1975.

Five(5) copies of the following additional data is also provided:

1. Proposed Agenda for the July 1975 Progress Review Meeting.

2. Action Items List from June Meeting.

The Software Development portion of this report has not been completed. We expect to have a Software Plan available for review at the July 24 meeting satisfying the intent of the Agency's referenced request.

We look forward to meeting with Agency representatives here in Sunnyvale on July 24, 1975, and have included an Agenda item for the Agency to review its critique of the June meeting.

Should you require any additional information in connection with this submission, please contact William M. Slingland, our Project Manager, or the undersigned.

Very truly yours,
AMPEX CORPORATION

William J. Cassell fp

William J. Cassell
Manager, System Contracts

WJC/fp

Encl:
as

c.c. Contracting Officer

Terabit Memory Systems Department
Ampex Corporation • 1400 Fashion Island Blvd., San Mateo, California 94404
Telephone (408) 738-4910 TWX 910-378-5920 TELEX 348464

CONTRACT XG 3766

TMS-2 MASS STORAGE SYSTEM

MONTHLY TECHNICAL PROGRESS REPORT - JUNE 1975

I. HARDWARE DEVELOPMENT

As discussed during the last progress review, planned activities for June involved start of hardware checkout and cleanup activity to enable Ampex to freeze the hardware to a maintenance only activity by early August. This action is proceeding on plan with the exception of final rework of the channel simulators which are expected to slip into late August and for which Agency assistance was requested. }*

Accomplishments for June are as follows:

1. Completion and checkout of the Ampex funded tape dubbing buffer feature.

2. Upgrade of the transport driver (Nova) software operating system to support tape dubbing buffer special commands.

3. Incorporation of the latest engineering changes to improve tape loading and vacuum sensing for the dual transport module as well as to reflect current production configuration for the logic modules in the data channels and transport drivers.

4. Checkout of the TCIF READ/COMPARE feature is started and is scheduled for July completion.

Planned reconfiguration of the SCP and EDCP DEC hardware to the final Agency configuration originally planned to begin in late June was rescheduled to early July to take advantage of DEC's offer to perform diagnostics before and after reconfiguration to verify that Ampex action did not adversely affect the DEC equipment which is covered by separate Agency maintenance and repair contract.

* STATINTL [redacted] called System Concepts' President, Mr. Levitt AND explained importance of Program & asked that they get the Channel Simulators moving. AMPEX notified.

... 2

II. SOFTWARE DEVELOPMENT

Software staffing was strengthened by the hiring of the following new programmers who will come on board during July to support the functions noted:

P.N. Butler	-	Work Management, works for R. Miner.
J.E. Gonzales	-	Diagnostics, works for D. Lemos.
G.M. Klein	-	File Transfer, works for R. Levy.

WMS/fp

AGENDA

TMS-2 MASS STORAGE SYSTEM

JULY PROGRESS REVIEW

I. LOCATION

Ampex Corporation, 1020 Kifer Road, Sunnyvale, Ca.

II. SCHEDULE

Thursday, July 24, 1975, 9:00 A.M. - 5:00 P.M.

III. AGENDA ITEMS

0900 - 0915	Introduction/Summary Overview
0915 - 0930	Review of June Action Items
0930 - 1000	Agency Critique of June Meeting
1000 - 1015	Break
1015 - 1045	Hardware Review/Status
1045 - 1200	PSAT/FAT Discussions
1200 - 1300	Lunch
1300 - 1430	Software Review/Status
1430 - 1445	Break
1445 - 1500	Cost/Financial Report Review
1500 - 1530	Other Open Items/Establish Schedule for August Review
1530 - 1700	Summary Review and Action Items List

TMS-2 MASS STORAGE SYSTEM
PROGRESS REPORT FOR JUNE ACTIVITY LOG

Item No.	Action Item Description	Date Entered	Responsibility for Action	Remarks	Completion Date
1	Contractual resolution of the four(4) Ampex issues raised related to Amendment No.5.	6-19-75	[redacted] STATINTL	See Ampex letter TMS-2/035.	
2	Agency delivery commitment for CDC Disks.	6-19-75			
3	Ampex to submit request for Government Bill of Lading indicating recommended mod of transportation and suggested vendor thirty(30) days prior to equipment delivery (October 1, 1975).	6-19-75			
4	Resolution of PSAT test procedures and plans.	6-19-75	W.M. Slingland/ [redacted] STATINTL	To be addressed during meeting at Ampex 6-20-75.	
5 Done!	Selected functions identified for estimates of regular evaluation of degree of completion.	6-19-75	- Select Items. Slingland - provide monthly estimates.		
6	Prompt payment of pending and future vouchers.	6-19-75	[redacted] STATINTL		
7	Ampex submit proposal for maintenance contract.	6-19-75	W.M. Slingland	Proposal scheduled for submittal to be discussed at August Review Meeting.	
8	Fixed Price Contract Modification for air compressor changes.	6-19-75	STATINTL [redacted]		
9	Detail schedule of documentation requirements	6-19-75	W.M. Slingland		
10 Done!	Agency to review possibilities for assisting Ampex re Systems Concepts channel simulators schedules.	6-19-75	[redacted] STATINTL		

X

AGENDA

TMS-2 MASS STORAGE SYSTEM

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TMS-2 MASS STORAGE SYSTEM

ACTION ITEMS SUMMARY

ITEM	DESCRIPTION	COMPLETED	OPEN-	RESPONSIBILITY
1	RESOLUTION OF AMENDMENT NO.5 ISSUES		X	AGENCY
2	CDC DISKS	X		
3	REQUEST FOR GOVERNMENT BILL OF LADING		X	AMPEX
4	PSAT TEST PROCEDURES AND PLANS	X		
5	SELECTED FUNCTIONS IDENTIFIED FOR DEGREE OF COMPLETION EVALUATION	X		
6	PROMPT PAYMENT OF VOUCHERS		X	AGENCY
7	PROPOSAL FOR MAINTENANCE CONTRACT	X		
8	CONTRACT MODIFICATION FOR AIR COMPRESSOR CHANGES	X		
9	DETAIL SCHEDULE OF DOCUMENTATION	X		
10	AGENCY ASSISTANCE - SYSTEMS CONCEPTS CHANNEL SIMULATORS	X		

W.M. Slingland
7-24-75

STAT [redacted]

SYSTEMS CONCEPTS 524 SECOND STREET SAN FRANCISCO, CALIFORNIA 94107

July 22, 1975

Mr. Bill Slingland
Ampex Corporation
1020 Kifer Road
Sunnyvale, California 94086

Dear Mr. Slingland:

This is to confirm in writing the telephone conversation of July 18, 1975, among the following: Michael Levitt, Stewart Nelson (Systems Concepts, Inc.); Bill Slingland, Tracy Wood, George Stadelmann (Ampex), regarding reworking and training for CS-11E Channel Simulators.

Units will be reworked and delivered with consoles according to the following schedule:

UNIT NUMBER	DELIVERY	COMMENTS
#1	Aug. 11	
#2	Aug. 18	
#3	Aug. 25	
#4	Sept. 2	
#5	Sept. 9	
#6	Sept. 16	
#7	Sept. 23	
#8	Sept. 30	Prototype CS-11E

A five-day training course will be given at Ampex the week of October 6, 1975, as outlined below:

Monday - Programming of CS-11E via PDP-11. Description of Microprocessor Code.
Tuesday - Description of Diagnostic Hardware. Discussion of Diagnostic Software.
Wednesday - Descriptions of Microprocessor Control Logic and IBM Style Interface.
Thursday - Descriptions of Clock and Timing Logic. Details of PDP-11 Interface.
Friday - Debugging Session. Isolation of Hardware Faults using Logic Drawings and Diagnostic Software.

Continued on page two

TELEPHONE: 415-495-5466 TWX: 910-372-0562

I trust the schedules above will be satisfactory, but should there be any question, please let us know as soon as possible.

Yours truly,

Michael Levitt
President

ML/ht

TMS-2 MASS STORAGE SYSTEM

HARDWARE MAINTENANCE REPORTING

PROGRAM: "FREEZE" HARDWARE CONFIGURATION -

IMPLEMENT CONTROLLED MAINTENANCE RECORDS SYSTEM

TIMING : 4 AUGUST 1975

PLAN :

- "SEAL" HARDWARE FROM FURTHER DEVELOPMENT CHANGES
- DESIGNATED MONITORS MUST SIGN OFF ACCESS TO AND COMPLETION OF ALL MAINTENANCE ACTION
- DOCUMENT AND COMPILE MAINTENANCE HISTORY

W.M. SLINGLAND
7-24-75

Approved For Release 2001/07/12 : CIA-RDP83T00573R000500060007-7

TMS-2 MASS STORAGE SYSTEM

MAINTENANCE LEVEL

MASS STORAGE SYSTEM

- DATE STORAGE SECTION
  - DUAL TRANSPORT MODULE 1 AND 2
  - DATA CHANNEL 1 AND 2
  - TRANSPORT DRIVER 1 AND 2
- COMMAND AND CONTROL SECTION
  - SCP 1 AND 2
  - EDCP 1 AND 2
  - TDIF 1 AND 2
  - TCIF 1 AND 2
  - CHANNEL SIMULATOR 1, 2, 3 AND 4
  - PRIVATE DISKS AND CONTROLLERS
  - PERIPHERALS

BACKFILL STORAGE SYSTEM

- DISKS AND CONTROLLERS

W.M. SLINGLAND
7-24-75

AMPEX CORPORATION ASD – 1020 KIFER ROAD SUNNYVALE, CA 94086

FIELD MAINTENANCE REPORT – RESIDENT

REPORT SERIAL NO. 00302 (1–5)

SITE NO. (6–9)

MO. DAY YEAR (10–15)

ACTION (16): N NORMAL; W WARRANTY; B BILLABLE; O OTHER

TYPE (17): 1 HARDWARE; 2 SOFTWARE; 3 HUMAN ERROR; 4 UNDETERMINED

REMEDIAL HOURS (18) MIN. (22)

PREVENTIVE HOURS (23) MIN. (27)

CSE'S INVOLVED (28)

DOWN-TIME HOURS (29) MIN. (33)

SECTION ALPHA (34) NUMERIC (39)

FCN NUMBER (40–43)

MODIFICATION REQUIRED (44)

MALFUNCTION CAUSE (45–46):

01	NORMAL WEAR AND USE	07	SITE ENVIRONMENT (TEMP. & HUMIDITY)
02	MF'G WORKMANSHIP	08	CUSTOMER ACTION ABSENT OR INCORRECT
03	SITE WORKMANSHIP	09	EQUIPMENT ABUSED
04	DESIGN DEFICIENCY	10	FCN CHANGE (NO FAILURE)
05	SITE POWER		
06	SITE NOT CLEAN		

WORK ORDER

MO. DAY YEAR

☐ REMEDIAL ☐ PM

W ☐ M ☐ SA ☐

BW ☐ Q ☐ A ☐

DISCREPANCY/SYMPTOMS: _____

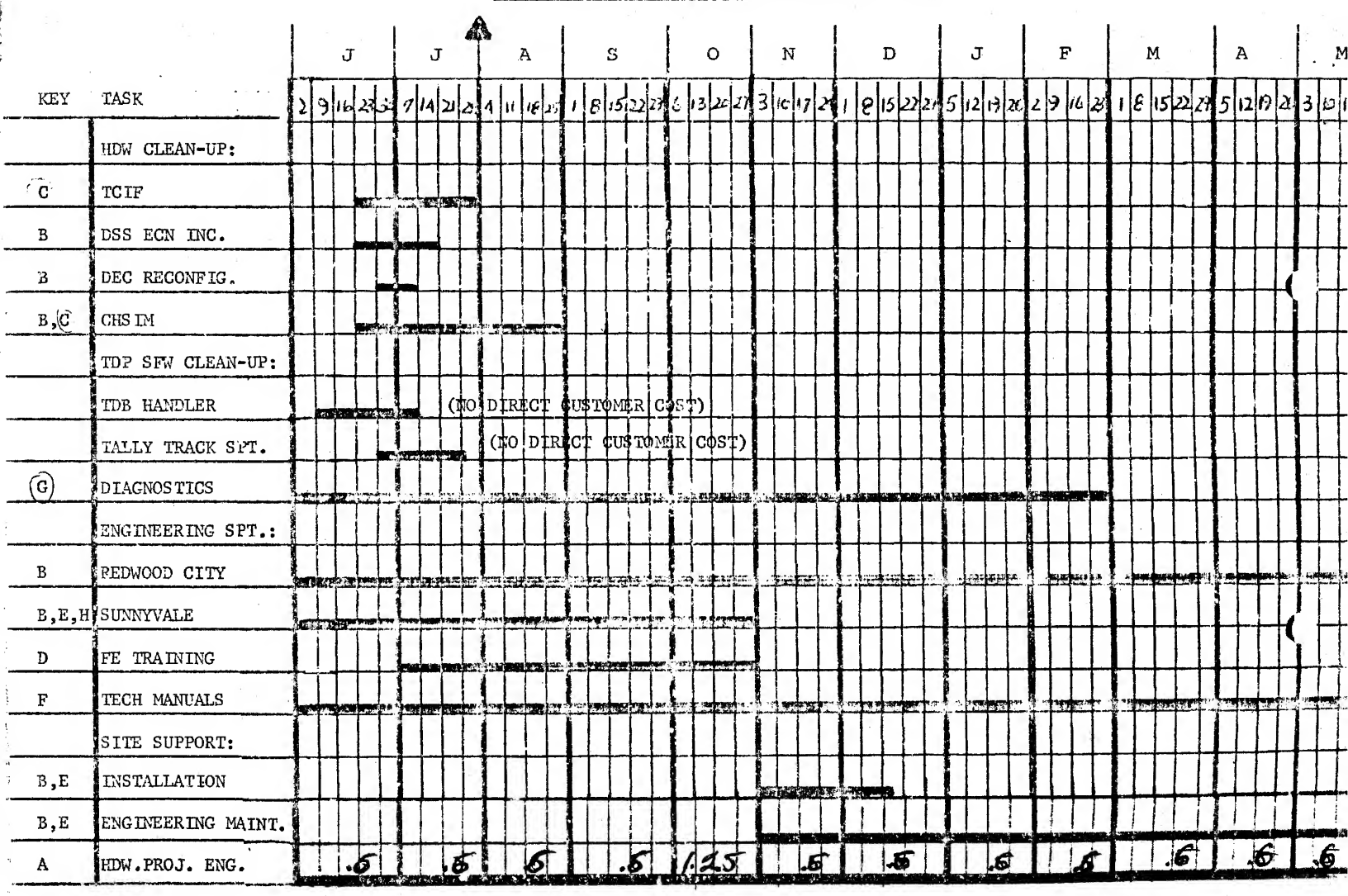
ORIGINATOR: _____

CORRECTIVE ACTION OR COMMENTS: _____

FIELD ENGINEER: _____

UC-4061 HOME OFFICE COPY – WHITE SITE COPY – YELLOW

TMS 2 HARDWARE SCHEDULE (MAINTENANCE ONLY)



TGW 7/24/75

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KEY	LABOR	FUNCTION	SCHEDULED LABOR EXPENDITURES												
			J	J	A	S	O	N	D	J	F	M	A	M	TOT.
	P. E.:														
A		SUSTAINING ENGINEERING PROJ. ENG.	0.5	0.5	0.5	0.5	0.75	0.5	0.5	0.5	0.5	0.5	0.5	0.5	6.25
B		ENG. SUPT./SITE INST.	1.0	1.0	0.5	0.5	1.0	1.5	2.0	1.5	1.0	1.5	1.0	1.0	13.5
C		REMAIN. DEVEL.	0.5	0.5	0.3	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	--	3.3
D		MAINTENANCE TRAINING	NO DIRECT CUSTOMER COST												
E		SERVICE ENGINEERING	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	12.0
F		TECHNICAL MANUALS	0.05	0.25	0.25	0.5	0.75	0.75	0.5	0.25	0.5	0.5	0.25	0.25	4.80
G		DIAGNOSTIC SUPPORT.	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	3.6
H		DSS TEST PROGRAMS	0.5	1.0	1.0	1.0	1.0	---	---	---	---	---			4.5
		TOTALS	3.85	4.55	3.85	4.05	5.05	4.30	4.55	3.8	3.55	4.05	3.33	3.05	47.95
	J. E.:														
A		SUSTAINING ENGINEERING PROJ. MGT.	0.1	0.1	0.1	0.1	0.5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.6
B		ENG. SUPT./SITE INST.	0.5	0.5	0.5	0.5	1.0	1.0	1.0	0.5	---	---	---		5.5
C		REMAIN. DEVEL.	0.25	0.25	0.25	---	---	---	---	---	---	---	---		0.75
F		TECHNICAL MANUALS	---	0.25	0.25	0.25	0.25	0.25	0.25	---	---	0.25	0.25		2.00
G		DIAGNOSTIC SUPPORT	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.2
H		DSS TEST PROGRAMS	0.25	0.25	0.25	0.25	--		--						1.0
		TOTALS	1.20	1.45	1.45	1.20	1.85	1.45	1.45	0.7	0.2	0.45	0.45	0.2	12.05
	TECH:														
B		ENGINEERING SUPPORT	0.5	0.3	0.3	0.3	0.5	0.5	---						2.40
		TOTALS	0.5	0.3	0.3	0.3	0.5	0.5							2.40
	DRFT:														
B		REMAIN. DEVEL.	0.5	0.5	0.5	0.5	---	---	---						2.00
F		TECHNICAL MANUALS	0.5	0.5	0.5	0.3	1.0	1.0	1.0	0.3	0.3	0.3	0.3	---	5.2
		TOTALS	1.0	1.0	1.0	0.8	1.0	1.0	1.0	0.3	0.3	0.3	0.3	---	8.2

TMS 2 HARDWARE STATUS

HARDWARE CLEAN-UP:

TCIF:	All design changes necessary to support Read Compare feature have been incorporated and tested.
DSS ECN Inc.:	Numerous engineering change upgrades have been made to the DSS hardware, including features to support improved tape loading, reliable vacuum sensing, and removal of certain logic overload conditions.
DEC Reconfiguration:	The SCP and EDCP hardware has been reconfigured to a standard arrangement by Ampex personnel.
CHSIM:	A new written commitment has been received for completion of Channel Simulator requirements by Systems Concepts. All in-house units are functionally usable and will remain so throughout the completion of the rework cycle.

TDP SOFTWARE CLEAN-UP:

TDB Handler:	Final TDP code changes were incorporated and tested for support of the tape dubbing feature.
Tally Track Support:	All Tally Track Commands at the TDP level have been activated and tested.
Diagnostics:	Work has begun on upgrading TDP diagnostic programs. Present emphasis is on combining four separate diagnostic systems into a single core image.

ENGINEERING SUPPORT:

Redwood City:	Limited reliability testing continues. TDIF/NOVA upgraded to final configuration.
Sunnyvale:	New tapes initialized for maintenance only mode of operation. Due to start August 4.
FE Training:	Training Program commenced on June 30 and will continue through late October.
Technical Manuals:	Review of DSS manuals is underway as an integral part of the Training Program.

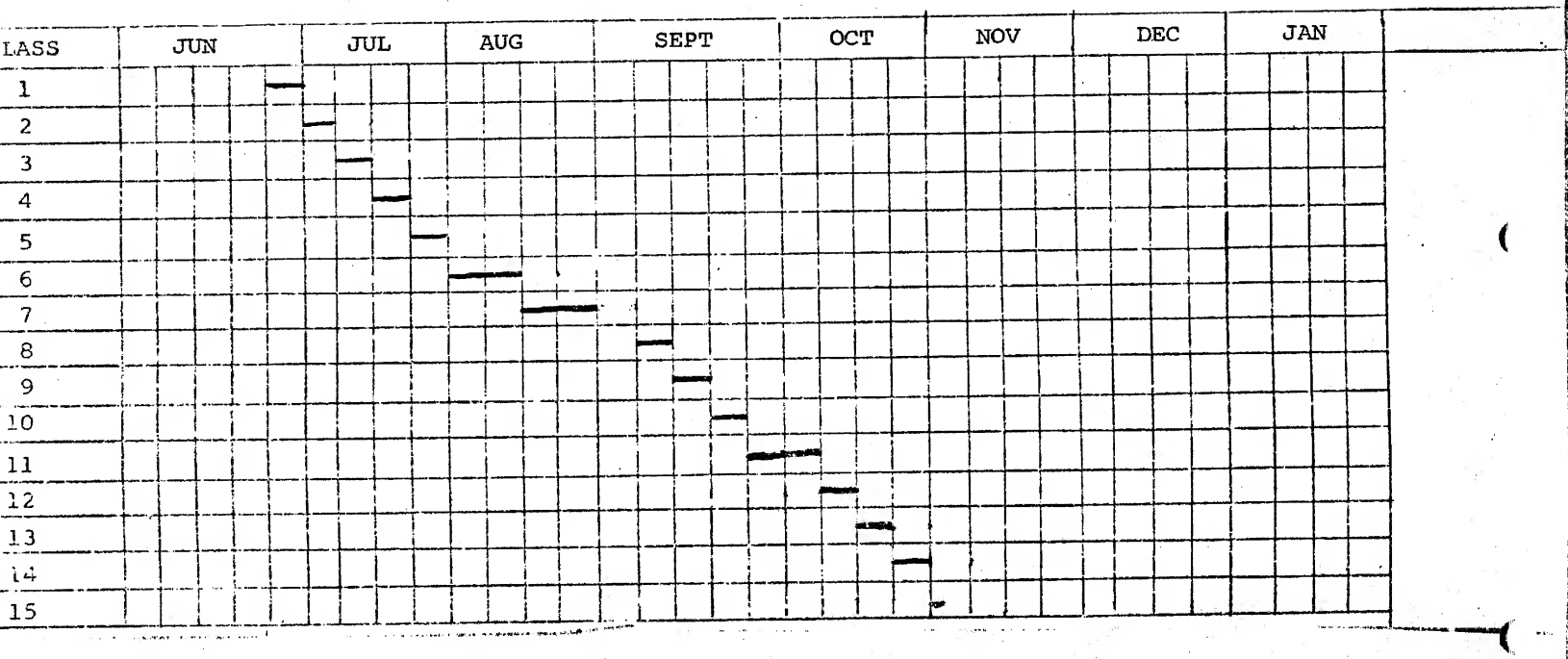
SITE SUPPORT:

Installation:	Air Compressor System shipped and installed. Vacuum Module shipped. Installation and check-out of the Air and Vacuum Modules is scheduled for completion during the week of July 28, 1975.
Engineering Maint.:	Not applicable.

HARDWARE PROJECT ENGINEERING: On-going support by Spiros Moulats to coordinate all aspects of the TMS 2 hardware related activities.

TGW 7/24/75

FIELD SERVICE TRAINING SCHEDULE



PROJECTED DELIVERY SCHEDULES

TMS 2	November 1, 1975
TMS 3	January 23, 1976
TMS 4	April 5, 1976

NOTE: The above schedule runs according to Ampex Fiscal Year '75 Scheduling Calendar

6/15/75

IBM MEMORY SYSTEMS MAINTENANCE TRAINING

Course Outline

1. NOVA OEM School (Data General Corp.)

   OEM training (reference memo "NOVA 1210 Training").

2. System Introduction (Wood/Roberti)

   Overall System Function - External Control, data flow.

   System Description - Major Unit functions - Internal control, data flow - System specifications.

   Tape description and format - Head stations and relations among heads.

   System timing - Clock distribution and usage - Data organization, timing - Relations among servos.

   Rotary head recording fundamentals.

3. Data Channel Introduction (Miller)

   Overview - Data Channel Functions - Role in system - Review of course documents.

   Composite block diagram - Relation of physical assemblies to block diagram - Signal flow - Signal composition.

   Write Channel block diagram - Card file functions - Transport functions.

   Read Channel block diagram - Card file functions - Transport functions.

   Video Head characteristics - Functional - Physical.

   Data Channel/Transport switch matrix.

   Data Channel/Transport Driver interface. Subdevice definitions.

   Logic Module physical/functional organization.

   Frequency standard - distribution.

   Write Channel control/data flow - Logic block diagrams.

   Read Channel control/data flow - Logic block diagrams.

4. Transport/Transport Driver Introduction (Moulats)

   Transport functions - Description of subassemblies.

Course Outline

4. Transport/Transport Driver Introduction (Con't) (Moulats)

Transport/Transport Driver interconnections - Switch matrix - Floor cables.

Transport Driver functions - Description of subassemblies.

Subsystem block diagrams - Transport switching - Reel, Video Head, Capstan Servos - Auxiliary track write/read - Erase.

TCP/Transport Driver interfaces - Block diagrams - device definitions and functions - NOVA interface introduction.

Documentation review.

5. Transport Driver Operating System (TCOS) (Christensen)

Function of TCP - Basic commands - Relation to interface.

Command execution - Step-by-step breakdown - Auxiliary functions.

Introduction to on-line diagnostics.

Command Entry.

Program organization - Core organization - Supervisor - Interrupt handling - Command processing.

TCOS Documentation review.

6. Transport Driver Hardware (I) (Moore)

TDP Interface Design - NOVA I/O Bus features - I/F device definitions - Priority chains.

TCP/Data Channel Interface - Device 42 design - Subdevice organization.

Auxiliary Track Interfaces - Signal conditioning circuits, read/write - Devices 24, 25, 26, 30, 31, 32, 33.

7. Transport Driver Hardware (II) (Moulats/ Stadelmann)

Transport Selection/Switching - Device 22 - Switch control matrix - Switch status network.

Reel Servo/Tape Speed Servo - Command/Status - Motor characteristics - Vacuum Chamber characteristics - Servo design - Malfunction monitoring - Local controls.

Video Head Servo - Command/Status - Motor characteristics - Tach design - Servo design - Local controls.

7. Transport Driver Hardware (II) (Con't.) (Moulats)

Capstan Servo - Command/Status - Motor characteristics - Tach design - Servo design - Operating modes - Local controls.

Vacuum/Pressure System - System supplies - Controls/Sensing - Transport Module plumbing, gauges.

Transport/Transport Driver internal power distribution - Power control - d.c. supplies - Power monitors.

System power distribution, characteristics, control - System ground design.

Accessories - Transport Driver Display Panel - Transport Driver Manual Control Panel - Transport accessory switches.

8. Data Channel Hardware (Miller)

Review of introduction - Equipment description - FM signal flow - Control logic functions - major timing.

Internal power distribution - power supplies.

Data Channel harnessing - Documentation.

Data Channel/Transport Switching - Switch matrix configuration - Switch control matrix configuration.

FM Subsystem - FM, pilot spectra - Write Channel signal conditioning - Read Channel signal conditioning.

Data Channel/Transport Driver interface - Control/Status message transmission - Relation of messages to data organization, timing - Messages used for production and maintenance operations.

Frequency Standard - Distribution of timing references within Data Channel.

Write Channel control logic - Subdevices 1, 5, 14, 24, 30 - Data routing control - Data timing control.

Write Channel data logic - DIB - EDC encoder - Data Test Pattern Generator.

Read Channel control logic - Subdevices 1, 5, 11, 14, 23, 24, 30.

Read Channel data logic - Data Test Pattern Comparator - Subdevices 23, 30 - EDC decoder - DIB.

Subdevice 13 - Display Panel - Manual Control Panel - Subdevices 12, 20.

9. TDP Maintenance/Diagnostics Systems (Christensen)

Quick-Check System - Measurement process - Features unique to Quick-Check - Limitations.

Automatic Alignment - Functional alignment procedure - Alignment program description - Tables - Limitations.

Tape Check - Features unique to Tape Check - Limitations.

Loop Generator - Language/Command set - Program tables - System organization.

NOVA diagnostics - Standard Data General Corporation packages.

1Ø. Transport/Transport Driver Maintenance (Moulats Roberti Carlin)

Routine Maintenance - Transport cleaning - Brake adjustment - Vacuum/Pressure adjustment - Tape tracking adjustment - Tape path examination - Servo alignments - Fastener checks - Tape initialization/pretest - Power supply checks.

Trouble-shooting - Interpretation of on-line diagnostic returns - Use of off-line diagnostic facilities - Use of unit simulators - Major unit fault-isolation - subassembly fault-isolation - Protection of tape - Personnel safety considerations.

Repair - Subassembly removal/replacement - Subassembly alignment - Post-repair testing - PWA-internal fault isolation - PWA repair - Cable repair - Test equipment.

System start-up/Recovery from power failures - Vacuum/Pressure turn-on - power turn-on - Tape Loop preparation - Program reload.

Maintenance document review.

Maintenance Logs.

11. Data Channel Maintenance (Miller Roberti)

Routine Maintenance - Data Channel drift checks - Inter-channel checks - Video Head signal conditioner alignments - Female guide adjustment - Video Head phase adjustment - Tape calibration, quality checks - Power supply checks.

Trouble-shooting - Interpretation of on-line diagnostic status - Use of off-line diagnostic facilities - E-E operation - Waveform interpretation - Noise isolation - Erase problems - Logic fault-isolation - Data accuracy checks.

Repair - Subassembly removal/replacement - Circuit alignment Post-repair testing - PWA-internal fault isolation/repair - Alignment of new Video Heads - Rotary transformer adjustment - Test equipment.

11. Data Channel Maintenance (Con't) (Miller Roberti)

Error recovery techniques - Error analysis.

Maintenance document review.

Maintenance logs.

12. EDCP/SCP Hardware (Hong, Moore, Stadelmann, Systems Concepts)

TDP/SCP Interface - Functional/Physical description - Device 20 - TDIF Interface - System Interconnections.

Data Channel/External data - Channel Processor (EDCP) Interface - Functional/Physical description - Data Interface Buffer (Module P) - System Interconnections.

Channel Simulator - Introduction - Functional/Physical description - Interconnections.

13. SCP Software

Off-Line System - Relationship to on-line operation - Operator controls - Test procedures available.

Utility Programs - Data Accuracy test summary - TDP program assembly - SCPOS assembly.

Documentation Review - Manuals (5) - Notes and memos available.

14. EDCP Software

Introduction - Function of EDCP in System - Overview of EDCP Operating System (EDCPOS).

Command/Status Interface - Command/Status formats and storage locations - EDCP/Data Channel communications.

Operating Instructions - Reloading - Ampex supplied diagnostics.

15. Vacuum Supply Module/Air Supply Module (Carlin Tarahteeff)

Mechanical Function - Control Electronics - Preventive Maintenance.

D I S C U S S :

— FUNCTION LIST

- o EXPLAIN CHART (1)
- o REVIEW CHART (1)
- o ANALYZE FUNCTIONS (4)

— MODULE CHART

- o REVIEW HIGHLIGHTS (1)
- o EXPLAIN CHART (1)
- o REVIEW DETAIL (4)

IAT

7/24/75

F U N C T I O N

IAT

7/24/75

R E C O V E R Y

WM	Miner FT	Levy OS	Bruf MISC	Lemos	
		8			Host Timeout on Command Response
		8			Host/SCP Communication Line
8+		8			Host Failure
5	8				No Path Avail. to a BSS Vol. while Ascending Data
5	8				No Path Avail. to a BSS Vol. while Descending Data
5	8				No Path to any BSS Volumes while Ascending Data
5	8				No Path to any BSS Volumes while Descending Data
5	8				Bad Track/Cyl. on a BSS Vol. while Ascending Data
5	8				Bad Track/Cyl. on a BSS Vol. while Descending Data
5	8				Head Crash on a BSS Vol. while Ascending Data
5	8				Head Crash on a BSS Vol. while Descending Data
5	8				Wrong BSS Volume Mounted - Ascend
5	8				Wrong BSS Volume Mounted - Descend
7		C			Power Failure to Entire MSS
7		?			Master SCP Failure, Slave SCP Available
7		?			Slave SCP Failure, Master SCP Available
7		?			Both SCP Central Processing Units Fail
	8				One EDCP Failure
7	8				Both EDCP's Fail while Ascending Data
7	8				Both EDCP's Fail while Descending Data
7	8				TBMTAPE Write Error
7	8				TBMTAPE Read Error
7	8				TBMTAPE Breaks or Stretches
7	8				TBMTAPE Drive Failure
	8				Loss of One Transport Driver
7	8				Both Transport Drivers Fail
	8				A Read Channel Failure
7	8				Both Read Channels Fail
	8				A Write Channel Failure
7	8				Both Write Channels Fail
	8				A Tape Dubbing Buffer Failure
8	8				Both Tape Dubbing Buffers Fail
		8			One or More Consoles Fail, but one still operable
7		8			All Consoles Fail
		8			DEC Line Printer Failure
		?			DECtape Unit Failure
		8			Paper Tape Reader Failure
7		8			MSS 3330's - Wrong Volume Mounted at IPL
7	8	8			MSS 3330's - Bad Track/Cyl. on One Volume
7	8	8			MSS 3330's - No Path Available to One Volume
7	8	8			MSS 3330's - No Path Available to Either Volume
7	8	8			MSS 3330's - Head Crash on One Volume
7	8	8			MSS 3330's - Head Crash on Both Volumes
7		?			MSS Integrity of the Private Files is Questionable

IAT - 7/24/75

O P C O M M A N D S

WM	Miner FT	Levy OS	Bruf MISC	Lomos	
		8+			Display Status
		8+			Display Unit
?	?				Display Volume
C	5	8+			Set
	8+				IPL
		7			STOP
	3				Mount
	4				Demount
2	5				Vary
8+					Check
			8		Maint
C					Display File
C					Delete File
C					Create GDG
C					Display GDG
C					Delete GDG
C	C				Monitor Files
C	C				Monitor Files, Off
C		?			Flush Unit
		?			Flush Host
C					Rename and Newname
7	8+				Erase
8+					Create Group
8+					Display Group
8+					Delete Group
6					Compress
5	C				Move
7					Ascend File
7					Descend File
4	C				Disperse
4	3				Disperse, Off
C					Display Job
7					Cancel Job
8+					Hold Job
8+					Release Job
C					Monitor Jobs
C					Monitor Jobs, Off
8+					Replace File
6		8+			Display RBA
?		8+			Display Address
6		8+			Change RBA
?		8+			Change Address
6		8+			Dump RBA
C		8+			Dump Address
8+					PBUILD
8+					PDISPLAY
8+					PDISPLAY AUDIT

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A L L E L S E

WM	Miner FT	Levy OS	Bruf MISC	Lemos	
	3				TEMTAPE Preparation
	8+				Tally Track Processing
		5			Concurrent Console Support
		6			HSS-MSS Communication
		C			Message Queuing
	8+	?			Priority Processing
3					GDG Support
4					Host Binding
1					HSS Space Allocation
	3				Ordered Queuing
C	C				Ascend
C					Job Binding
C					Job Termination
C					Deallocation
C	C				Descension
8+		?			Security
	3				Remark Processing
8+	C	?			Monitoring
			8+		Maintenance and Diagnostics

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INTEGRATION DISTRIBUTION

	C	R1	AUG	SEP	OCT	NOV	DEC	JAN	FEB	FEB+	?	LINES NOW	TOTAL LINES EST	% COMPLETE	% TOTAL
		1	2	3	4	5	6	7	8	8+	?				
(44) RECOVERY	-	-	-	-	-	-	-	1	37	1	5	0	10000	0	12
OP CMNDS	13	-	-	2	1	1	1	4	1	19	5	4362	8367	52	10
ALL ELSE	6	1	-	4	1	-	2	1	1	3	3	57384	67581	85	78
	19	1		6					39	23	13	61746	85948		100%

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ORGANIZATION DISTRIBUTION

RESPONSIBILITIES	# FUNCTIONS	
1 GROUP	57	51 %
2 GROUPS	47	42 %
3 GROUPS	7	6 %
	111	99 %

+ INTEGRATION BY SEPARATE GROUP

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M O D U L E S

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COMPONENT NAME	INTEGRATION TOTALS 6/1/75	7/1/75	EST TOTAL (3/1/75)	% COMPLETE	COMMENTS
WORK MANAGEMENT	6951	6183	9150	68	
FILE MANAGEMENT	1364	1364	3850	35	
FILE TRANSFER	12585	13576	21300	65	
DMS	2698	2731	3550	77	
OFCMNDS	5182	4362	8367	52	
SCPOS	4608	5765	6000	96	
EDCPOS	11072	13615	14500	94	(Complete)
RSX11A	9212	9212	9212	100	(No Estimate)
MISC	1120	3119	3119	100	(No Estimate)
PGLINK	1818	1820	1900	96	(Complete)
DIAGNOSTICS	-	-	5000	0	(Not Started)
TOTAL	56610	61746	85948	72 %	

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INTEGRATION COUNTS

SYSTEM/ MODULE NAME	MAY #CDS	MAY OCTAL #BYTES	JUNE #CDS	JUNE OCTAL #BYTES	JULY #CDS	JULY OCTAL #BYTES
WORK MANAGEMENT	6,951	30,435	6,183	14,748 $34,634_8$		
FILE TRANSFER	12,585	64,262	13,576	29,810 $72,162_8$		
DMS	2,698	11,374	2,731	5,057 $11,701_8$		
OPCMDS	5,182	20,372	4,362	10,062 $23,516_8$		
SCPOS	4,608	115,705	5,765	43,695 $125,257_8$		
EDCPOS	11,072	217,136	10,346	13,392 $32,120_8$		
RSX11A	9,212	(17,033) in misc	9,212	7,645 $16,735_8$		
MISC.	1,364-En 2,938	5,075 35,750	3,119	8,648 $20,710_8$		
PGLINK	(1,818) in misc		1,820	$32,312_8$		
DIAGS	in EDCPOS		3,269	$171,036_8$		
TOTAL:	56,610	$183,823_{10}$ $547,017_8$	60,383	$208,553_{10}$ $627,251_8$		

DIL 7/8/75

GROUP	NAME	#SRC	UNIT TEST	INTEG	DOC	F/I STATUS	P/R	OCTAL #BYTES	TASK	FUNCT DESCR	DESIGN	CODE START	CODE FINISH

GROUP	NAME	#SRC	UNIT TEST	INTEG	DOC	F/I STATUS	P/R	OCTAL #BYTES	TASK	FUNCT DESCR	DESIGN	CODE START	CODE FINISH
EDCPOS	ACHK	93	✓	June	–	F	R	110					
	ALSTK	110						164					
	ARITH	99						70					
	BILDS	85						70					
	BUFR	114						143					
	CHLIND	863						3310					
	CMDTSK	1550						6754					
	COMMON	385						1024					
	CONTSK	1346						2130					
	DUMMY	16						Ø					
	EAR	68						10					
	EAW	82						44					
	ER	208						414					
	ERGEN	179						Ø					
	ERINT	106						132					
	ERRORS	133						250					
	EXCEL	69						32					
	GEDD	95						111					
	INITL	360						1360					
	IOSOB	164						376					
	LOWCOR	125						422					
	NULTSK	21						24					
	QUEUE	159						307					
	RCEU	81						40					
	REQSB	176						235					
	RQEX	146						24					
	RQIO	173						414					
	RQLDB	123						156					
	SCPIND	284						1304					
	SCPTSK	441						714					
	SQUE	161						160					
	SYSUB	185						312					
	TABLS	717						100					
	TBMIND	438						1474					
	TERM	243						210					
	TIMES	263						334					
	TTYIND	292						766					
	WAIT	93			62.18			76					

GROUP	NAME	#SRC	UNIT TEST	INTEG	DOC	F/I STATUS	P/R	OCTAL #BYTES	TASK	FUNCT DESCR	DESIGN	CODE START	CODE FINISH
WM	CRTR29	238	✓	June	-	F	P	665					
	JBASND	371			107			1636					
	JBDSND	546			112			3404					
	JCFLCT	243			89			600					
	JCNBF	125			91			444					
	JDISKF	68			-			132					
	JDISKU	667			-			3540					
	JEASNL	141			-			470					
	JEDIT	154			-			544					
	JENDIO	307			-			1676					
	JFEND	191			115.3			571					
	JGDGØ1	273			-			652					
	JLOGIT	153			-			704					
	JMSG	770			79			3660					
	JOBEND	219			-			750					
	JOBIN1	226			87			756					
	JOBIN2	581			99			3260					
	JPOST	220			108			670					
	JSUBS	246			-			476					
	ORAØ93	230			-			606					
	READER	208			-			364					
FT	BLOCKA	74	✓	June	-	I	P	140					
	CNVRT	91			209.20	F		172					
	COPY	392			-			1216					
	DFALOC	300			-			734					
	DFTACT	161			209.7.17			702					
	DFTADD	114			209.7.5			446					
	DFTALD	56			209.7.28			136					
	DFTAOS	242			-			752					
	DFTASF	63			209.7.30			216					
	DFTAJM	88			-			206					
	DFTDEA	230			209.7.32			1344					
	DFTDOS	242			-			774					
	DFTDJM	90			-			220					
	DFTELC	355			209.26			1576					
	DFTERB	152			-			516					
	DFTERM	144			-			452					

GROUP	NAME	#SRC	UNIT TEST	INTEG	DOC	F/I STATUS	P/R	OCTAL #BYTES	TASK	FUNCT DESCR	DESIGN	CODE START	CODE FINISH
FT (Cont)	DFTERT	243	✓	June	-	F	P	604					
	DFTINT	236			-	I		1004					
	DFTRDV	264			-	F		1046					
	DFTSPC	108			-	I		146					
	DFTØØ1	79			-	F		230					
	DKRTRQ	102			209.5			330					
	DKWTRQ	104			209.4		↓	316					
	EDIF	697			-		R	2516					
	EDIO	227			209.11		P	544					
	EDTDLD	333			-			1746					
	EDV	197			299.8			400					
	EDVATE	230			-			324					
	EDVDCK	164			-			474					
	EDVDRD	170			-			460					
	EDVDUP	164			-			374					
	EDVD3R	201			-			462					
	EDVEXT	116			-			326					
	EDVVRD	192			-			1354					
	DTAPRT	145			209.4			264					
	FTBLKA	492			-			2462					
	FTBLKC	55			-			162					
	FTBLKS	243			-			1310					
	FTDEMK	277			-			2226					
	FTDETT	83			-	↓		222					
	FTDINT	182			-	I		414					
	FTMONF	132			-	F		544					
	FTSMIT	208			-			1320					
	FTTEST	105			209.27			722					
	OPLDPR	257			-	↓		1516					
	SETLOG	211			-	I		664					
	TDCS	130			-	F		420					
	TDIO	272			-			742					
	TDIO1	221			-		↓	606					
	TLTDIF	959			-		R	3516					
	TLYDUP	233			-	↓	P	650					
	TMALMT	153			-	I		420					
	TRANSL	287			-	F		1546					
	TSTDSK	178			-	I		434					
	T A	283	↓	↓	-	F		1402					

GROUP	NAME	#SRC	UNIT TEST	INTEG	DOC	F/I STATUS	P/R	OCTAL #BYTES	TASK	FUNCT DESCR	DESIGN	CODE START	CODE FINISH
FT (Cont)	TXD	303	✓	June	-	F	P	1520					
	TS1	317			-	F		1402					
	WDPLOG	136			-	I		576					
	WMSADL	479			209.16	F		1736					
	WMSERR	157			209.16			512					
	WMSIM1	400			209.16			742					
	XWTD	87			-			462					
MISC													
EO	DSPAV	258	✓	June	-	F	P	656					
	DSPD	261						1006					
	DSPE	322						1334					
	DSPV	347						1301					
	DSP1	176						354					
	EDT	720						4335					
SS	FORM4	35					S	136		STANDALONE - DOS			
	IPL	358					S	1726		"	"		
	MOUNT	276					R	3202		DOS			
	RECØ	96					R	440		"			
	RECØWR	36					R	162		"			
	WFORM4	37					R	152		"			
	333ØDF	197					R	774		"			
BB	PGLINK	1820					R	32312		DOS			
	EXE9Ø	1961					S	73204		STANDALONE			
	PBF2A	938					S	71632		"			
	EDTST	320				I	S	4000		"			

GROUP	NAME	#SRC	UNIT TEST	INTEG	DOC	F/I STATUS	P/R	OCTAL #BYTES	TASK	FUNCT DESCR	DESIGN	CODE START	CODE FINISH
SCPOS	CHLHND	690	✓	June	-	F	R	2744					
	CPRI	75			62.5		P	226					
	DEQ	144			62.9		P	440					
	DISP	66			34		R	202					
	DLHND	363			-		R	2200					
	DUMP	367			-	I	R	2126					
	ENQ	123			62.12	F	P	404					
	GETBUF	202			53.2		R	1010					
	GETDAT	23			-		P	56					
	GETPKT	55			-		R	144					
	GETTIM	23			-		P	56					
	HOSTST	63			-	I	P	214					
	HSTSIM	77			-	F	P	206					
	INST	101			62.14	F	R	372					
	INTHST	58			-	I	P	202					
	IOCTL	124			26.1	F	R	362					
	IRVING	8			-	I	R	Ø					
	MSGERR	50			-	F	P	220					
	MSGP	104			38		P	1423					
	MSGR1	41			-		R	76					
	MSGR2	369			-		P	1653					
	POST	102			62.16		P	322					
	RELBUF	117			53.6		R	430					
	RELPKT	34			-		R	64					
	SCHED	173			36		R	704					
	SCPTBL	908			-		R	75000					
	STRTUP	423			-		R	2133					
	SWAIT	157			-		R	544					
	TRACON	454			44		R	2056					
	WTD	271			-		P	1426					
DMS	DMSAAD	554	✓	June	-	F	R	1332					
	DMSCAD	355			-			1042					
	DMSCHK	252			-			630					
	DMSCHN	334			-			1030					
	DMSDMP	48			-			150					
	DMSHSH	338			-			754					
	DMSMSC	355			-			1164					

GROUP	NAME	#SRC	UNIT TEST	INTEG	DOC	F/I STATUS	P/R	OCTAL #BYTES	TASK	FUNCT DESCR	DESIGN	CODE START	CODE FINISH
DMS (Cont)	DMSRAW	229	✓	June	-	F	R	666					
	DMSRTR	163	↓	↓	-	↓	↓	350					
↓	DMSTBL	103	↓	↓	-	↓	↓	1657					
OPCMDS	CANCEL	154	✓	June	-	F	P	326					
↓	CHECK	171	↓	↓	-	↓	↓	406					
	CNKDRL	260	↓	↓	-	↓	↓	1260					
	CNSDMP	119	↓	↓	-	↓	↓	442					
	CONVRT	181	↓	↓	-	↓	↓	550					
	CREATE	414	↓	↓	-	↓	↓	1540					
	DISPLY	325	↓	↓	-	↓	↓	1704					
	DSFILE	359	↓	↓	-	↓	↓	2164					
	FLHST	206	↓	↓	-	↓	↓	530					
	FLUSH	261	↓	↓	-	↓	↓	574					
	HOLD	144	↓	↓	-	↓	↓	326					
	INITPR	156	↓	↓	-	↓	↓	470					
	MONITR	296	↓	↓	-	↓	↓	670					
	OPCMD	514	↓	↓	-	↓	↓	3730					
	PARSE1	150	↓	↓	-	↓	↓	272					
	PRNTDB	189	↓	↓	-	↓	↓	702					
	RELEAS	154	↓	↓	-	↓	↓	326					
↓	SET	309	✓	✓	-	↓	↓	1334					

of Contractor Ampex Corporation

MONTHLY CONTRACT STATUS REPORT NO. 76-1

Period 3 May 1975 to 31 May 1975 Date: July 18, 1975

Contract No. XG 3766 Task No. _____ Project No. _____

Period of Contract June 1973 to August 1976

	Estimated Cost	Fee	Total
Amount of Contract :	2,448,084	126,916	2,575,000
Amount of Obligations and/or Expenditures This Period :	44,832	-0-	44,832
Amount of Obligations and/or Expenditures to Date :	1,736,807	126,916	1,863,723
Estimate of Funds to Complete :	584,361	-0-	584,361

Percentage of Funds Expended to date 72.4%

Percentage of Work Completed to date 62.4%

(Note: All amounts shown must include overhead, G&A, handling charges, fees, etc.)

Is work on schedule? Yes

Can the Contract be completed in the authorized time? Yes

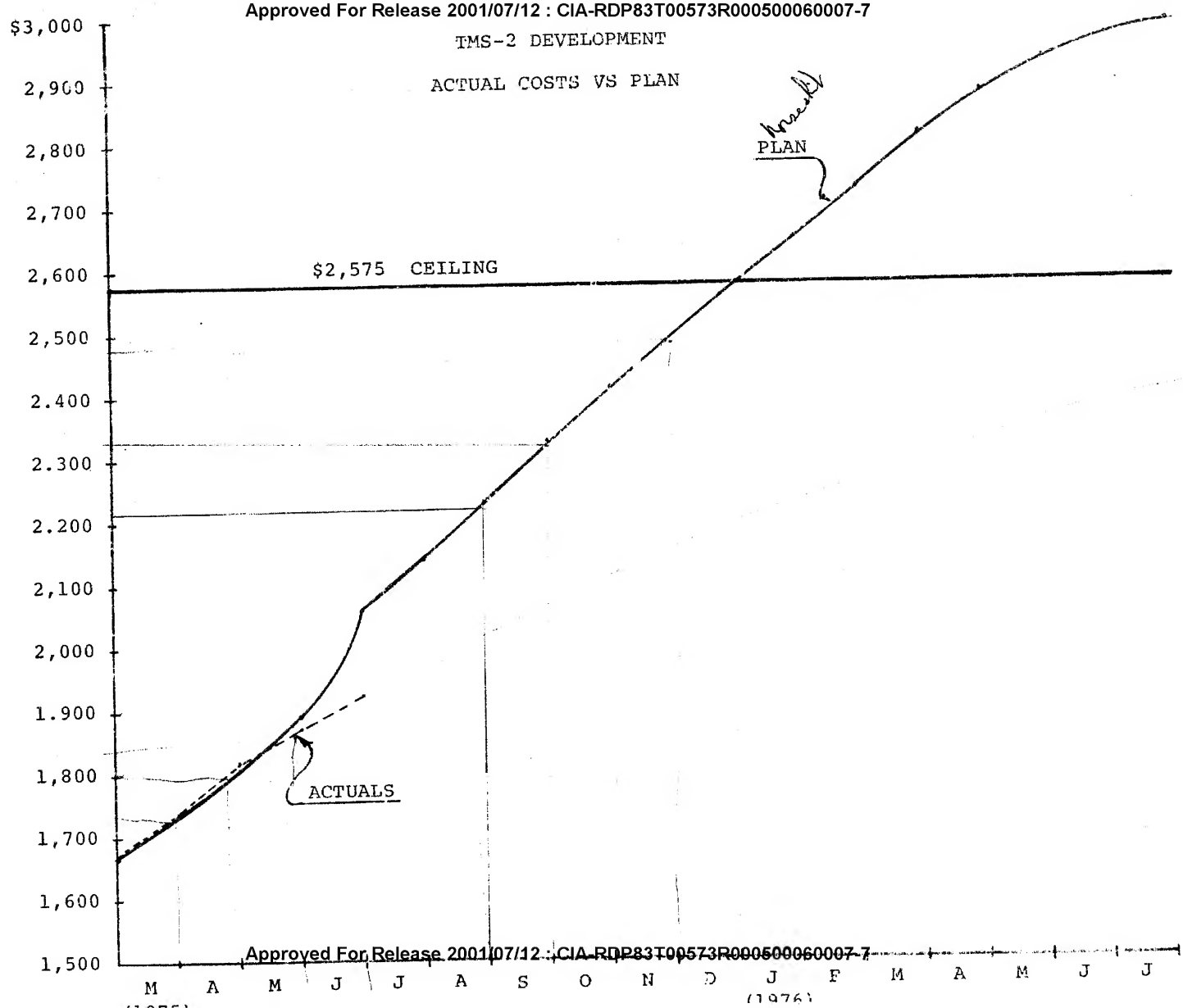
Can the Contract be completed with the authorized funds? Yes

Comments:

Percentage of work completed to date based on Ampex Cost Proposal of 5-2-75 with Modification #5 deletions and reductions.

Estimate at completion is $2,985,423.

Submitted by _____



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TMS-2 MASS STORAGE SYSTEM

CONTRACT XG 3766, JOB # MATRIX

EFFECTIVE MAY 3, 1975

TMS-2 Development
All Costs
Contract XG 3766
Job #7199

HARDWARE	SOFTWARE	MAINTENANCE
Development Job #7100	Work Management Job #7200	All Maintenance Job #7212
System Integration & Test Job #7204	File Transfer Job #7201	
Ship Site Installation Job #7206	System Control Job #7202	
Final Acceptance Job #7208	Non-Specific Job #7203	
Documentation/Tech Manuals Job #7210	System Integration & Test Job #7205	
	Ship Site Installation Job #7207	
	Final Acceptance Job #7209	
	Documentation/Tech Manuals Job #7211	

WMS
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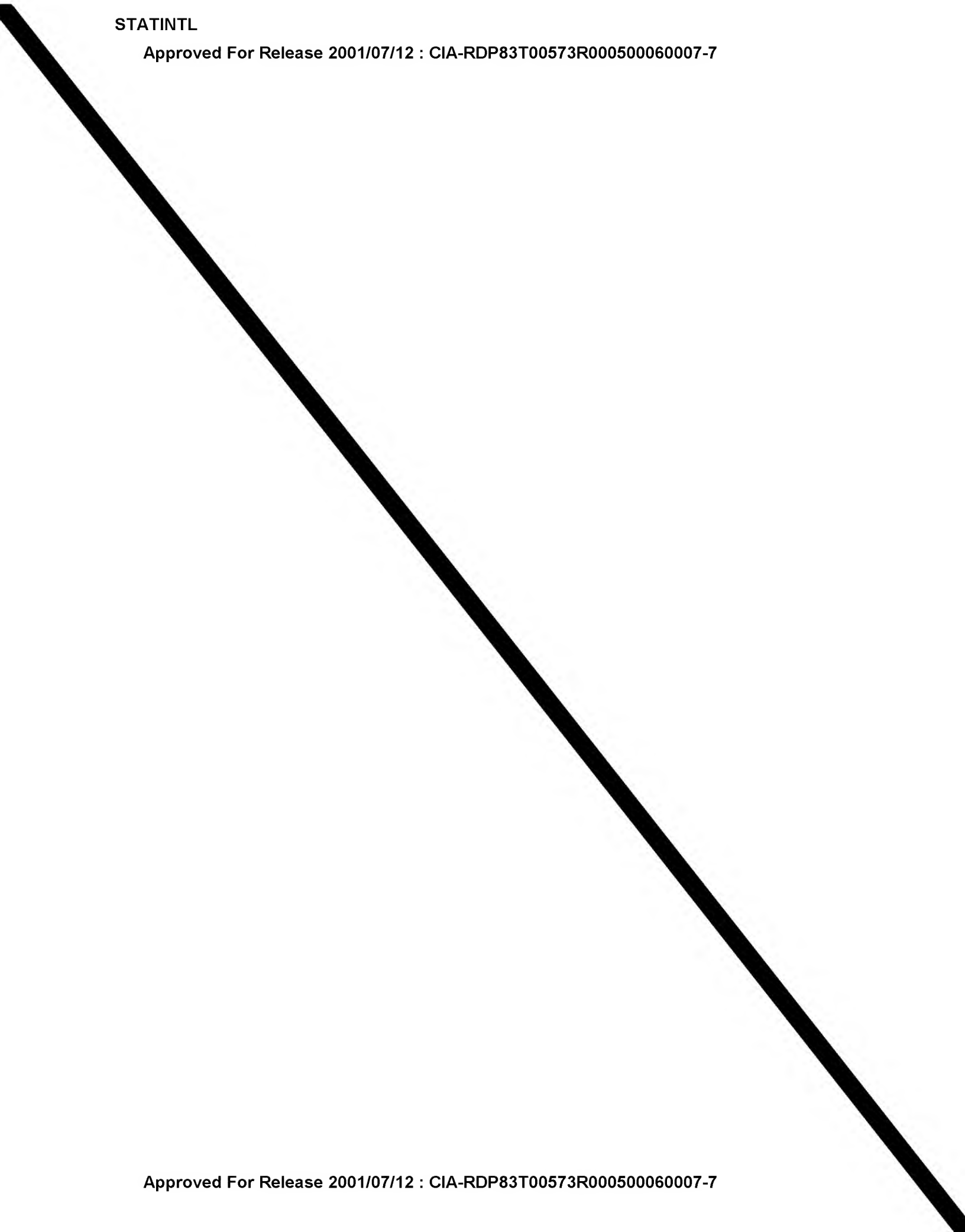

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ADDITIONAL SUPPORTING DATA

CONTRACT XC 3766, TMS-2 MASS STORAGE SYSTEM DEVELOPMENT

(Covering Period 5/3/75 - 5/31/75)

	Pgm. Hrs.	P.E. Hrs.	J.E. Hrs.
I. DIRECT LABOR			
a. Software Development			
1. Work Management (7200)			
Ellison, L.	40		
Stevenson, A.	122		
2. File Transfer (7211)			
Crittenden, W.	65		
Fortis, N.	152		
Yuan, H.	152		
3. System Control Program (7202)			
Bruffey, W.	102		
Crittenden, W.	62		
4. Non-Specific Effort (7203)			
Antonio, J.			152
5. System Integration and Test (7205)			
Levy, R.	32		
Stevenson, A.	30		
Total Software Development	757	-	152

... 2

 Additional Supporting Data (Covering Period 5/3/75 - 5/31/75)

	Pgm. Hrs.	P.E. Hrs.	J.E. Hrs.
b. Hardware Development			
1. Development (7100)			
Birch, R.		72	
Garner, G.		4	
Carlin, M.			6
Donnel, J.			18.5
Schafsteck, R.			8
2. System Integration and Test (7204)			
Carlin, M.			3
Moulats, S.		67	
Schafsteck. R.			2
Total Hardware Development	-	143	37.5

II. SUBCONTRACT

Informatics

	Amount
February 1975 Services	$ 5,025
March 1975 Services	4,887
April 1975 Services	6,070
Total	$15,982

... 3

III. MATERIAL

	Amount
Petty Cash (intracompany travel)	$ 195
Elmar Elec.	66
Digital Equipment Corp.	231
AVSD Material Charges	(104)
Total	$ 388

IV. TRAVEL & OTHER DIRECT COSTS

Birch, Per Diem	$ 980

TMS-2 MASS STORAGE SYSTEM

COST REPORT/ACTUALS VS PLAN

(In Thousands)

Month	Plan Rate	Plan Cum	Actuals Rate	Actuals Cum	Variance Rate	Variance Cum
Actuals thru Feb 1975	$ -	$1,665.8	$ -	$1,665.8	$ -	$ -
March	76.1	1,741.9	77.0	1,742.8	.9	.9
April	60.0	1,801.9	76.4	1,819.2	16.4	17.3
May	91.4	1,893.3	44.8	1,864.0	(46.6)	(29.3)
June	160.1	2,053.4	58.7*	1,922.7*	(101.4)	(130.7)
July	87.7	2,141.1				
August	89.0	2,230.1				
September	93.9	2,324.0				
October	79.0	2,403.0				
November	78.7	2,481.7				
December	90.4	2,572.1				
January 1976	77.0	2,649.1				
February	74.8	2,723.9				
March	91.8	2,815.7				
April	67.0	2,882.7				
May	48.0	2,930.7				
June	29.6	2,960.3				
July	25.1	2,985.4				

* Preliminary Data

WMS
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7/24/75

CONTRACT STATUS - XG-3765

A. Received Amend. #5 which provides for:

1) Additional Funds for up graded compressor system	$18,198.00
2) Additional Funds for IBM Disk rental	3,405.00
Total	$ 21,603.00

B. Revised contract value is:

Auth. & Funded Initial System	
Initial System	$ 449,141
DEC Equipment	319,490
IBM Equipment Rental	27,161
Air Supply & Vac. Module	59,744
Subtotal	855,536
Funded but not authorized Increment 2 System	496,194
Total Contract Value	$ 1,351,730

C. Hardware Status

Initial System - Complete (except System's Concepts) and ready for Government acceptance and transfer to Contract XG-3766

DEC Equipment - Complete

Air Compressor System - Shipped to Agency July 1, 1975

Vacuum Blower Module - July 16, 1975

DD250's on Air Compressor and Vacuum Blower submitted to Contracting Officer.

7/24/75

CONTRACT STATUS - XG-3766

A. Received Amend. #5 which PROVIDES for

1) Incorporation of MSS Design Spec. (3/19/75)

2) Revised Milestones

3) Increase in est. cost by $855,096

4) Established a ceiling at $2,575,000 (including fee)

B. Received additional (GFE) CDC disks and controllers. Ampex in process of putting on Gov't. Property tags.

C. Preparing interium Patent Report

D. Received separate P.O. for CDC disk rental (Dec. '75 - June '75).

E. The following vouchers are still open.

#18	submitted	5/13	$57,900
#19	"	6/24	14,000
#20	"	7/05	6,800
#21	"	6/24	139,000

F. Submitted a summary maintenance proposal.